

PAST AND PROPOSED FIRE MONITORING STRATEGIES AT NOAA'S SATELLITE SERVICES DIVISION

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ABSTRACT

The Satellite Services Division (SSD) of NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) processes and analyzes data from the nation's environmental satellites and several other satellites. The Division's Satellite Analysis Branch (SAB) issues advisories on a variety of meteorological phenomena. With access to near real time satellite data from a variety of sources and the presence of a 24 hour per day staff of analysts, the Division is in a unique position to provide support to the fire fighting community through the issuance of advisories on fire activity, which can be detected and monitored by several satellite-borne sensors. NESDIS operates two Geostationary Operational Environmental Satellites (GOES) viewing the east and west coasts of the U.S. The imager on these satellites collects image data in 5 spectral bands, at 1 kilometer (km) resolution in one visible band, and 4 or 8 km resolution in 4 infrared bands at 15 minute intervals, with more rapid scanning available when conditions warrant. Band 2, at 3.8 microns can differentiate "hot spots" arising from fire activity from surrounding terrain. Band 1, visible and other infrared bands will detect the presence of smoke plumes. NESDIS also operates two Polar Orbiting Operational Environmental Satellites (POES) which collect data worldwide every 6 hours. The Advanced Very High Resolution Radiometer (AVHRR) on these satellites collects image data in 5 spectral bands, all at 1-km resolution. Band 1, visible, and band 3, at 3.8 microns, provide smoke and fire data similar to that obtained by GOES bands 1 and 2. NESDIS also collects data from the National Aeronautics and Space Administration's (NASA) Total Ozone Mapping Spectrometer (TOMS), which may be used to detect smoke plumes. During the active fire season of 1997-98 in Indonesia, SSD analysts made available on the World Wide Web imagery of smoke and hot spots processed from AVHRR and data from Japan's Geostationary Meteorological Satellite (GMS). During spring and early summer 1998, large fires in Mexico produced smoke which drifted over the U.S., resulting in a request from the NESDIS International and Interagency Affairs Office for assistance in monitoring the situation. SSD's newly constituted Operational Significant Event Imagery (OSEI) team, charged with processing imagery of environmentally significant events world wide, provided hot spot and smoke imagery to SAB, which provided analyses to the National Weather Service (NWS) Hydrometeorological Prediction Center, which in turn used the information to predict smoke movement. During the large fire outbreaks in Florida in June and July 1998, the Florida Division of Forestry and NWS requested OSEI to post imagery of the situation for use in directing suppression efforts. Due to drought conditions in the spring of 1988 and an anticipated high incidence of fires later in the year, the Brazilian government, through the U.S. Agency for International Development requested NESDIS to post imagery of northern Brazil through November to be used in fire suppression activities. As a result of these and anticipated future requests, NESDIS is investigating the feasibility of instituting a formal fire support program. Elements of NESDIS' Office of Research and Applications are developing algorithms for the automated detection of fire activity from GOES and POES data. SSD is developing the Hazard Mapping System, which will permit SAB analysts to integrate results from these algorithms with data from other sources and interactively analyze satellite imagery to produce fire activity reports for North and Central America. These reports would be used by Federal, State and local authorities in fire suppression activities. SSD is currently inviting responses from potential users of such a product.